FEDERAL - STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

Arizona

By

Division of Irrigation, Soil Conservation Service

United States Department of Agriculture

As of

JAN. 15, 1951

Data included in this report were obtained by the agency named above in cooperation with the Federal, State and local organizations listed on the last page of this report.

FEDERAL-STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

FOR

ARIZONA

Report Prepared

by

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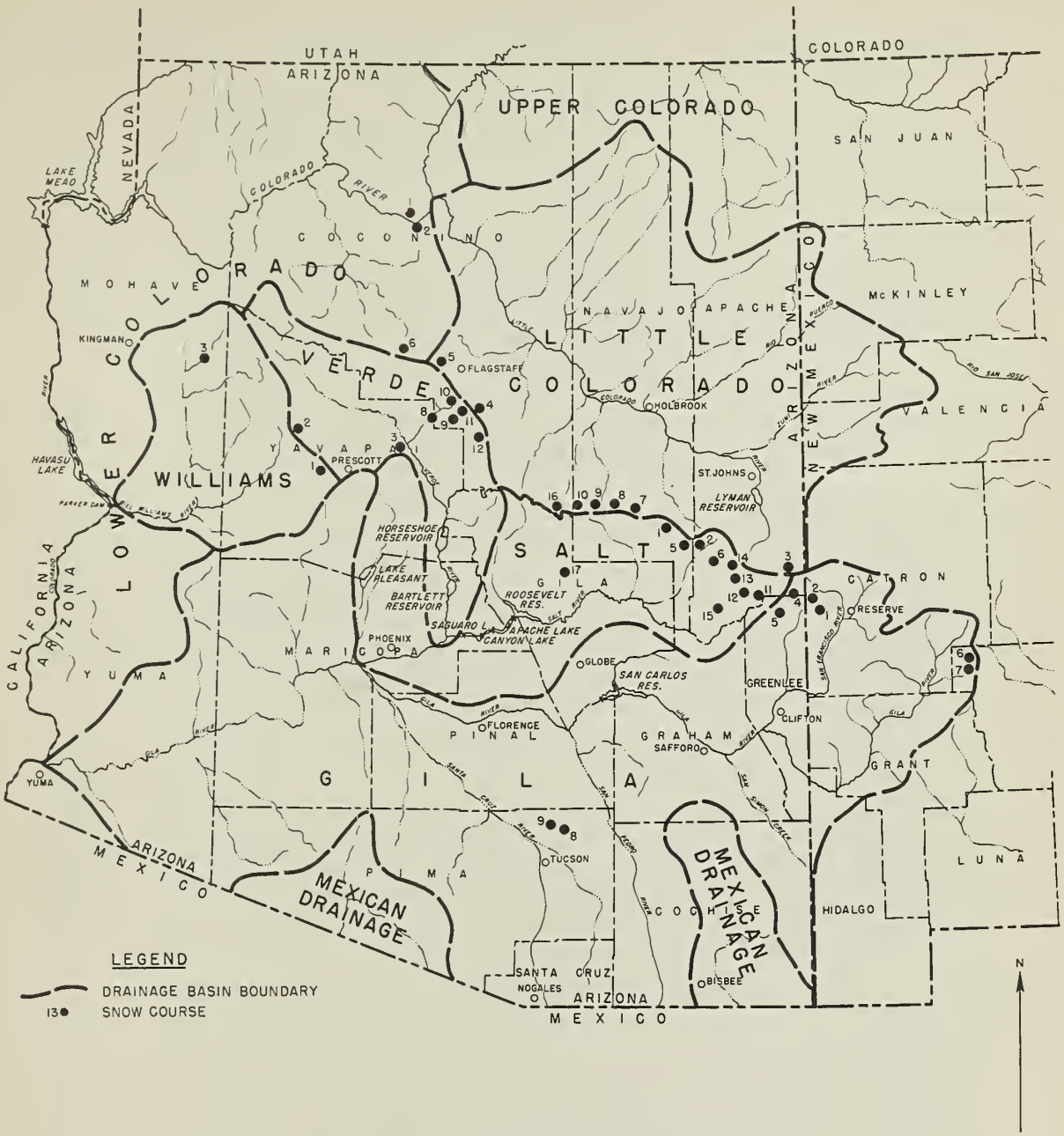

ARIZONA
COOPERATIVE SNOW SURVEYS

SNOW COURSES AND DRAINAGE BASINS
DECEMBER 1950

0 40 80 120 160 200
SCALE IN MILES

AGR-SCS-ALBUQUERQUE, N. MEX. M-178 DECEMBER 1950

INDEX TO SNOW COURSES

NUMBER	NAME	ELEVATION
	LITTLE COLORADO RIVER	
1.	Forest Dale	6,000
2.	McNary	7,200
3.	Nutrioso	8,500
4.	Mormon Lake	7,350
5.	Fort Valley	7,350
7.	Gentry	7,600
8.	Heber	7,600
9.	Canyon Creek	7,500
10.	Elk	7,600
11.	Mormon Mountain	7,500
12.	Happy Jack	7,630
16.	Woods Canyon	7,640
	WILLIAMS RIVER	
1.	Iron Springs	6,200
2.	Camp Wood	5,700
3.	Willow Ranch	5,000
	GILA RIVER	
1.	Frisco Divide (N.M.)	8,000
2.	State Line (N.M.)	8,000
3.	Nutrioso	8,500
4.	Coronado Trail	8,000
5.	Beaver Head	8,000
6.	Taylor Creek (N.M.)	7,850
7.	Inman (N.M.)	7,800
8.	Rose Canyon	7,300
9.	Bear Wallow	8,100
	VERDE RIVER	
1.	Iron Springs	6,200
2.	Camp Wood	5,700
3.	Mingus Mountain	7,100
4.	Morman Lake	7,350
5.	Fort Valley	7,350
6.	Chalender	7,100
8.	Munds Park	6,500
9.	Casner Park	6,930
10.	Antelope Park	7,300
11.	Mormon Mountain	7,500
12.	Happy Jack	7,630
	SALT RIVER	
1.	Forest Dale	6,000
2.	McNary	7,200
3.	Nutrioso	8,500
4.	Coronado Trail	8,000
5.	Milk Ranch	7,000
6.	McKay	8,250
7.	Gentry	7,600
8.	Heber	7,600
9.	Canyon Creek	7,500
10.	Elk	7,600
11.	Big Lake Knoll	8,800
12.	Maverick Fork	9,050
13.	Baldy	9,000
14.	Ft. Apache	9,160
15.	Pacheta	7,800
16.	Woods Canyon	7,640
17.	Parker Creek	5,500
	LOWER COLORADO RIVER	
1.	Bright Angel	8,400
2.	Grand Canyon	7,500
5.	Fort Valley	7,350
6.	Chalender	7,100

WATER SUPPLY OUTLOOK

Arizona
January 15, 1951

* *
* January 15, 1951, snow surveys show that the snow- *
* stored water on the principal watersheds of the *
* State, ranges from 25 to 60 per cent of normal. *
* Soil moisture conditions in the drainage areas *
* are poor, much of the soil being powder dry. *
* Little or no runoff will result from the present *
* snow cover. Reservoir storage in principal reser- *
* voirs is less than one-tenth of total capacity. *
* *

Precipitation: Precipitation far below normal has occurred throughout the State during the last six months. In some areas, the precipitation has been the poorest in 25 years. The lack of fall and early winter rains has resulted in extremely poor soil moisture conditions. The soil underlying the present snow cover is powder dry in most cases. Many of the mountain springs and wells are drying or are dry.

Snow Cover: The snow-stored water on the Verde River Drainage is about 30 per cent of normal, and 30 per cent of what it was last year at this time. Snow depths on this drainage area vary from 6 inches at Mormon Mountain to less than 2 inches at Mingus Mountain. An average snow cover for the whole drainage is less than 5 inches. The present snow cover is low in water content, and what little there is, is melting rapidly.

Snow-stored water on the Salt River Drainage is about 65 per cent of normal, and 50 per cent of last year. Snow depths vary from 4 inches at Forest Dale to about 12 inches near Big Lake on Mt. Baldy. The snow is extremely light and powdery. The average snow-stored water for this drainage area is less than 1.5 inches. Snow depths along the Mogollon Rim vary from 6 to 9 inches.

Snow-stored water on the Gila watershed is 50 per cent of last year, and 60 per cent of normal. Snow depths vary from 2 inches at Mutricos to about 6 inches in the higher mountains near Reserve, New Mexico. The average snow water content of the Gila drainage is about 1.1 inches. The Catalina Mountains report about 9 inches of snow.

Snow-stored water on the drainage of the Little Colorado is less than 50 per cent of normal. The Williams River Drainage has somewhat above normal snow-stored water, but still less than 2 inches. Soil moisture conditions are poor.

The Grand Canyon reports only 4 inches of show at the South Rim, and 8 inches on the North Rim. This is an average of about 1 inch of snow-stored water.

Runoff: October through December, 1950, runoff of both the Salt and Verde Rivers has been the lowest in 38 years of record. This poor runoff has continued during the first half of January, 1951. At present, the Salt River is running about 150 cubic feet per second, and the Verde about 250 cubic feet per second.

The Gila River runoff has been extremely low, as has the Aqua Fria River. Reservoirs on both of these rivers contain no usable storage. Promise of runoff is probably less than any year of record.

Reservoir Storage: On this date, the reservoirs of the State are storing about 8 per cent of capacity. Two reservoirs in the State, San Carlos and Lake Pleasant, are dry. Three other reservoirs, Horseshoe, Bartlett and Roosevelt, are storing 2,000, 3,000, and 3,000 acre feet respectively. The total stored-water in the eight important reservoirs of the State is 264,000 acre feet, or about 28 per cent of the 10 year average. Reservoirs on the Salt and Verde Rivers contain 40 per cent of last years storage. Lake Havasu contains 90 per cent of capacity, and Lake Mead is storing 17, 951,000 acre feet.

TABLE I

ARIZONA SNOW SURVEYS JANUARY 15, 1951

DRAINAGE BASIN and SNOW COURSE	LOCATION Number	Sec.	Twp.	Rge.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS Snow Depth (Inches)	Water Content (inches) Same Approx. Date 1951	1950	1949	Past Record Years of Av. Record	Water Content (IN.)
LITTLE COLORADO RIVER												
Forest Dale	1	2	9N	21E	6000	1/15	3.9	0.8	0	1.4	11	0.9
McNary	2	14	8N	23E	7200	1/15	11.4	2.2	2.4	3.3	11	2.3
Nutrioso	3	23	6N	30E	8500	1/15	2.4	0.3	1.8	4.9	11	2.0
Mormon Lake	4	13	18N	8E	7350	1/15	5.5	0.9	3.1	10.3	4	4.0
Fort Valley	5	22	22N	6E	7350	1/15	0.9	T	2.4	6.1	4	2.6
Centry	7	36	11N	15E	7600	1/16	7.1	1.5	3.0	New Course		
Heber	8	28	11N	15E	7600	1/16	5.7	1.1	2.7	New Course		
Canyon Creek	9	18	11N	15E	7500	1/16	6.7	1.1	3.4	New Course		
Elk	10	31	11N	14E	7600	1/16	9.0	1.8	3.5	New Course		
Mormon Mt.	11	14	18N	8E	7500	1/16	5.3	1.0	4.6	New Course		
Average							5.8	1.1	2.7	5.2		2.3
GILA RIVER												
Frisco Divide	1	31	6S	20W	8000	1/15	6.7	1.3	1.7	3.1	11	1.7
State Line	2	6	6S	21W	8000	1/15	4.7	0.9	1.5	3.5	11	2.3
Nutrioso	3	23	6N	30E	8500	1/15	2.4	0.3	1.8	4.9	11	2.0
Coronado Trail	4	26	5N	30E	9000	1/15	3.2	0.6	2.0	6.2	11	2.9
Beaver Head	5	13	4N	30E	8000	-	No Report		2.8	No Report	10	2.6
Taylor Creek	6	20	10S	10W	7850	1/15	4.7	1.5	1.1	No Report	7	0.9
Inman	7	6	11S	10W	7800	1/15	5.5	1.5	1.3	No Report	5	0.4
Rose Canyon	8	15	12S	16E	7300	1/14	7.3	1.4	2.3	0	3	0.8
Bear Wallow	9	6	12S	16E	8100	1/14	9.4	2.0	5.7	4.5	3	3.4
Average							5.5	1.2	2.2	3.7		1.9

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ARIZONA SNOW SURVEYS JANUARY 15, 1951

DRAINAGE BASIN and SNOW COURSE	LOCATION Number	Sec.	Twp.	Rge.	Elev.	Date of Survey	Snow Depth (Inches)	SNOW COVER MEASUREMENTS Water Content (Inches) 1951	Same Approx. Date 1950	Same Approx. Date 1949	Past Record Years of Record	Past Record Av. Water Content (Inches)
WILLIAMS RIVER												
Iron Springs	1	22	14N	3W	6200	1/15	2.0	T	T	5.2	5	0.3
Camp Wood	2	3	16N	6W	5700	1/15	8.8	1.5	0.8	4.9	5	1.2
Willow Ranch	3	16	21N	11W	5000	1/12	6.7	2.8	0	8.2	5	1.5
Average							5.8	1.4	0.3	6.1		1.0
Salt River												
Forest Dale	1	2	9N	21E	6000	1/15	3.9	0.8	0	1.4	11	0.9
McNary	2	14	8N	23E	7200	1/15	11.4	2.2	2.4	3.3	11	2.3
Nutrioso	3	23	6N	30E	8500	1/15	2.4	0.3	1.8	4.9	11	2.0
Coronado Trail	4	26	5N	30E	8000	1/15	3.2	0.6	2.0	6.2	11	2.9
Milk Ranch	5	28	8N	23E	7000	1/15	9.0	1.0	1.8	1.2	10	1.3
Gentry	7	36	11N	15E	7600	1/16	7.1	1.5	3.0	New Course		
Heber	8	28	11N	15E	7600	1/16	5.7	1.1	2.7	New Course		
Canyon Creek	9	18	11N	15E	7500	1/16	6.7	1.1	3.4	New Course		
Elk	10	31	11N	14E	7600	1/16	9.0	1.8	3.5	New Course		
Big Lake Knoll	11	2	5N	28E	8800	1/15	7.7	1.1	3.9	New Course		
Maverick Fork	12	13	6N	27E	9050	1/15	8.4	1.2	4.3	New Course		
Baldy	13	28	7N	27E	9000	1/15	10.0	1.6	2.9	New Course		
Ft. Apache	14	18	7N	27E	9000	1/15	12.1	1.9	2.5	New Course		
Pachota	15				7800	-	No Report		3.0	New Course		
Workman Creek	17	33	6N	14E	5860	1/15	6.9	2.6	New Course			
Average							7.5	1.3	2.7	3.4		1.9

TABLE I

ARIZONA SNOW SURVEYS JANUARY 15, 1951

DRAINAGE BASIN AND SNOW COURSE	LOCATION Number	Sec.	Twp.	Rge.	Elev.	SNOW COVER MEASUREMENTS Date of Survey	Snow Depth (Inches)	Water Content (Inches) Same Approx. Date 1951	1950	1949	Past Record Years of Record	Av. Water Content (Inches)
VERDE RIVER												
Iron Springs	1	22	14N	3W	6200	1/15	2.0	T	T	5.2	5	0.3
Camp Wood	2	3	16N	6W	5700	1/15	2.8	1.5	0.8	4.9	5	1.2
Mingus Mt.	3	3	15N	2E	7100	1/15	1.5	T	T	4.3	4	1.1
Mormon Lake	4	13	18N	8E	7350	1/15	5.5	0.9	3.1	10.3	4	4.0
Fort Valley	5	22	22N	6E	7350	1/15	0.9	T	2.4	6.1	4	2.6
Chalender	6	27	22N	3E	7100	1/15	4.8	0.6	2.8	7.2	4	3.4
Munds Park	8	7	18N	7E	6500	1/17	4.4	0.9	2.8	New Course		
Casner Park	9	19	18N	8E	6930	1/17	5.6	1.2	3.7	New Course		
Antelope Park	10	29	19N	8E	7300	1/17	5.6	1.1	3.8	New Course		
Mormon Mt.	11	14	18N	8E	7500	1/16	5.3	1.0	4.6	New Course		
Happy Jack	12	30	17N	9E	7630	1/17	3.2	0.2	New Course			
Average							4.3	0.7	2.4	6.3		2.1
LOWER COLORADO RIVER												
Bright Angel	1	34	33N	3E	8400	1/15	8.0	0.9	7.1	8.4	3	6.7
Grand Canyon	2	21	30N	4E	7500	1/15	3.6	1.5	2.3	5.4	3	2.8
Fort Valley	5	22	22N	6E	7350	1/15	0.9	T	2.4	6.1	4	2.6
Chalender	6	27	22N	3E	7100	1/15	4.8	0.6	2.8	7.2	4	3.4
Average							4.3	1.0	3.7	6.8		3.9

TABLE 2

STATUS OF RESERVOIR STORAGE, January 15, 1951

BASIN and STREAM	RESERVOIR	USABLE CAPACITY (1000 A.F.)	THOUSANDS ACRE FEET IN STORAGE About Jan 15				
			1951	1950	1949	1948	10 yr. Avg 1940-1949
Agua Fria	Lake Pleasant	179	0	6	7	1	16
Colorado	Lake Havasu	688	620	684	592	582	535
Colorado	Lake Mead	27,935	17,951	19,446	19,489	20,320	20,470
Gila	San Carlos	1,200	0	90	32	0	198
Verde	Bartlett	179	3	39	34	5	42[a]
Verde	Horseshoe	67	2	2	17	2	9[b]
Salt	Roosevelt	1,382	3	363	89	49	500
Salt	Apache	245	170	192	101	141	158
Salt	Canyon	58	48	7	12	26	24
Salt	Saguaro	70	38	22	24	12	12

a - Average for years 1941 through 1949

b - Average for years 1946 through 1949

LIST OF SNOW SURVEYORS

SNOW COURSE	SURVEYOR
Elk	Anderson, Peterson, West
Canyon Creek	Anderson, Peterson, West
Century	Anderson, Peterson, West
Heber	Anderson, Peterson, West
Forest Dale	Fair, Declay
McMary	Fair, Declay
Milk Ranch	Fair, Declay
Casner Park	Anderson, Greaves, Peterson
Munds Park	Anderson, Greaves, Peterson
Antelope Park	Anderson, Greaves, Peterson
Mormon Mountain	M. F. Greaves
Mormon Lake	M. F. Greaves
Mingus Mountain	M. F. Jones
Iron Springs	E. Saxby
Camp Wood	Mrs. C. C. Merritt
Willow Ranch	T. Miller
Grand Canyon	Sylvester, Moore, Thede
Bright Angel	Patrick, Patrick
Ft. Valley	P. Loska
Chalender	Oleson, Levine
Bear Wallow	W. H. Hughes
Rose Canyon	W. H. Hughes
Pacheta	F. Phillips
Big Lake Knoll	Anderson, Peterson, West
Maverick Fork	Anderson, Peterson, West
Baldy	Anderson, Peterson, West
Ft. Apache	Anderson, Peterson, West
Taylor Creek	F. M. Inman
Inman	F. M. Inman
Coronado Trail	J. B. Shumate
Nutrioso	J. B. Shumate
State Line	Liedman
Frisco Divide	Liedman
Beaver Head	J. Burke
Happy Jack	Ryberg, West
Workman Creek	C. L. Moore

The following organizations cooperate in the Arizona snow survey work:

FEDERAL

Department of Agriculture
- Forest Service
  - Apache Forest
  - Coconino Forest
  - Coronado Forest
  - Gila Forest
  - Kaibab Forest
  - Prescott Forest
  - Sitgreaves Forest
  - Southwestern Forest and Range Expt. Station, Fort Valley, Arizona
  - Sierra Ancha Experiment Forest Station
- Soil Conservation Service
  - Division of Irrigation

Department of Commerce
- Weather Bureau
  - Arizona Section

Department of Interior
- Bureau of Reclamation
  - Region III
- Geological Survey
  - Arizona District
- Indian Service
  - Fort Apache Reservation
- National Park Service
  - Grand Canyon National Park

Gila Water Commissioner
Safford, Arizona

IRRIGATION PROJECTS

Salt River Valley Water Users Association
Phoenix, Arizona

San Carlos Irrigation and Drainage District
Coolidge, Arizona

Southwest Lumber Mills, Inc., McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

Federal - State - Private

COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"